

September 23, 2019

Ms. Melissa M. SantucciRozzi, Assistant Director
Department of Planning and Community Development
1 JFK Memorial Drive
Braintree, MA 02184

**RE: Peer Review - Stormwater Management System
Parkside Apartment and Parkside Condominiums
383-385 Washington Street and Storrs Avenue
Braintree, Massachusetts**

Dear Ms. SantucciRozzi,

As requested, we have completed our review of the site plan and stormwater calculations for the above referenced project for compliance under the Braintree Stormwater Ordinance and Regulations, MA DEP Stormwater Management Standards, and EPA NPDES Regulations. We have also reviewed the proposed site plan against good engineering practice. This report is based on our review of the submitted documents listed below and a site visit on September 4, 2019.

- **Parkside Apartments Rental Narrative Description and Development Summary, dated February 5, 2017.**
- **Parkside Condominiums Ownership Narrative Description and Development Summary, dated February 6, 2017**
- **Site Plans for Parkside Apartments & Parkside Condominiums, Proposed Chapter 40B Residential Project, 383-385 Washington Street, Braintree, MA, prepared by DeCelle-Burke & Associates, Inc, dated February 2, 2017.**
- **Site Engineering Report for Parkside Apartments & Parkside Condominiums, Proposed Chapter 40B Residential Project, 383-385 Washington Street, Braintree, MA, prepared by DeCelle-Burke & Associates, Inc, dated February 2, 2017.**
- **Parkside Condominiums (Buildings B and C), 383-385 Washington Street, Braintree, MA, prepared by VMY Architects, LLC, dated February 6, 2017.**
- **Parkside Apartments (Building A), 383-385 Washington Street, Braintree, MA, prepared by VMY Architects, LLC, dated February 6, 2017.**

INTRODUCTION/BRIEF NARRATIVE OF PROJECT

The property covered by the application is located at 383-385 Washington Street, identified as Parcel ID 2028 0 31. The site is located on the westerly side of Washington Street and southerly side of Storrs Avenue. The site consists of two parcels and a private 40 ft wide right of way totaling approximately 2.6 acres. The largest parcel, Lot A consists of two- one story metal frame, slab on grade structures and one- one story concrete block building, unmaintained parking areas with minimal drainage. Lot A can be accessed through a 20 ft wide access easement from Washington Street. The second parcel, Lot 2

consists of unmaintained parking area and has been indicated that the parking area is currently used as unauthorized overflow parking for surrounding activities. The private right of way provides access to Storrs Avenue and is known as Alves Avenue. The way provides access and utility services to the site as well as the abutting property, 14 Storrs Avenue.

The property is encumbered by a 20 ft wide sewer easement and a 10 ft wide drainage easement. The existing 8-inch sewer main provides public sewer service to several properties within the area and is connected to the public sewer main in Storrs Avenue. The existing closed drainage collect stormwater upgradient of the site as well as site runoff which then discharges into an 18-inch drain pipe down gradient of the abutting athletic field. There is limited vegetation on site with the exception of the overgrown areas along the fence line at the property lines and within easement area between Lot A and Lot 2. The site's topography slopes from elevation 82-84 at the southeasterly corner to elevation 50 at the northwesterly corner.

The property is located in the General Business Zoning District and the Village Overlay District. The property is bounded by a municipal parking lot and commercial businesses along Washington Street to the east, the Braintree Masons Lodge to the south, the Archbishop Williams High School athletic field to the west, and residential and commercial properties along Storrs Avenue to the north.

The project proposes the raze the existing three structures and associated infrastructure and construct two residential developments – Parkside Apartments and Parkside Condominiums. The Parkside Apartments will consist of a 70-unit 3-story apartment building with underground garage (81 spaces) and surface parking (47 spaces). Parkside Condominiums will consist of 8-units within two town house buildings. All units will have a one car garage with one additional space within the driveway. There are five additional surface parking spaces designated for the condominiums.

Supporting utilities include new water, sewer, and gas mains which will connect to the existing infrastructure to maintain services to surrounding properties. A new stormwater management system is proposed to collect, treat and attenuate the site's stormwater runoff.

We offer the following comments on the proposal and have organized our comments in order of the referenced sections of the Stormwater Regulations. Our comments are noted in *italics*, and our recommendations are listed in ***Bold Italics***.

STORMWATER REGULATIONS – ARTICLE VI

Section 1 – Low Impact Design and Green Infrastructure

- a. The design of the project shall, to the maximum extent feasible, employ environmentally sensitive site design as outlined in the Mass. DEP Stormwater Handbook.

The project addresses this goal with the use of multiple subsurface infiltration systems to address the treatment and attenuation of the development's runoff.

- b. Evaluation of Low Impact Development practices is required and implementation of such practices to the maximum extent practicable is encouraged

*No documentation of which Low Impact Development Best Management Practices were evaluated and why such practices were found to be infeasible. **Please provide documentation.***

- c. In order to conserve potable water supplies and maximize recharge, it may be appropriate on some sites to store clean runoff for reuse on the site for irrigation or other gray water purposes.

*Although there is limited green space with the proposed site development, has any possible storage of rooftop runoff for landscape irrigation or other non-potable uses been considered for the project. **Please provide documentation.***

Section 2 – Hydrologic and Hydraulic Criteria

- a. Hydrologic analyses using TR-55/TR-20 methodology shall be performed on the entire project site and include any off-site areas that drain to or through the project site.

The hydrologic analyses have been provided. It seems that portions of the abutting properties up gradient of the site direct surface runoff onto the site that should be considered in the design, in particular from the municipal parking lot and the 14 Storrs Ave parking area. Please confirm the upper watershed limits for both pre- and post-development conditions and how surface runoff from these properties will be addressed.

- b. The analyses shall be performed for the 2, 10, 25 and 100-year design storms under pre-development and post-development conditions. The specified design storms shall be defined as a 24-hour storm using the most recent rainfall distribution recommended by the National Oceanic and Atmospheric Administration Atlas 14, as amended.

The drainage analyses have been performed for the 2, 10, 25 and 100-year design storm events and the rainfall intensity data generally follows the NOAA Atlas 14 estimates for the site location.

- c. The post-development peak discharge rate shall be equal to or less than the pre-development peak discharge rate, based on 2-year, 10-year, 25-year and 100-year 24-hour storms.

As presented in the drainage calculations, this standard is intended to be met as required. The treatment and attenuation of post development stormwater runoff is being provided by the proposed subsurface infiltration systems. See additional comments below which should be addressed to confirm compliance with this requirement.

- d. Hydrologic analyses are to be performed in a pre and post sub-watershed basis with designated control points at each location where runoff leaves the site or enters a water body.

The design points for both pre- and post-development conditions should include the westerly property line for uncontrolled surface runoff and the existing closed drainage system which collects a portion of the site through the existing closed drainage system and discharges off site to the west. Please provide updated analysis with two design points.

- e. The same land area shall be used in the analyses to facilitate comparison of existing and proposed conditions.

As presented in the drainage calculations, this standard is met.

- f. The total volume of discharge, as well as peak rate, shall be evaluated at each control point.

As presented in the drainage calculations, this standard is met. As stated above there should be two design points evaluated.

- g. The site shall be designed to ensure that all runoff from the site up to the 100-year storm enters the control structure. For example, the drainage system may only be sized to handle the 25-year storm, with larger storms flooding the distribution system and traveling overland. This overland flow, or overflow, must be directed into the peak control structure or otherwise managed to attenuate flow.

The proposed recharge system C surcharges during the 10-year storm event and larger with overflow out of the catch basin grate (Rim 57.7) near the Storrs Ave entrance which will then overflow onto Storrs Avenue per the proposed grading. The majority of the surface runoff under existing conditions does not discharge flow directly onto Storrs Ave but into the adjacent athletic field per the existing topography shown then potentially onto Storrs Ave. Could proposing an overflow connection to the existing closed drainage system to alleviate some of the surface flow onto Storrs Ave be considered?

- h. For the purpose of computing runoff, all pervious lands on site shall be assumed, prior to development, to be in “good” conditions regardless of conditions existing at the time of computation.

*The existing conditions indicates that all vegetated areas are grass in poor condition. **The analysis should be adjusted to indicate the overgrown areas of brush vs grass areas as well as indicate them as good condition as required or provide justification for current design parameters.***

- i. Off-site areas should be modeled as their present land use condition in good hydrologic condition.

Up gradient watershed areas should be reviewed and incorporated into the analysis as appropriate.

- j. The length of overland sheet flow used in time of concentration (TC) calculations shall be limited to nor more than 50 feet for pre and post development conditions.

*All time of concentrations were indicated as 10 minutes. The minimum time of concentration is typically 6 minutes as recommended in SCS Tr-55 methodology. **Time of concentration paths should be calculated and provided.***

- k. Stormwater Management Systems shall be designed to retain and/or treat the first one inch (1”) of runoff from all impervious surfaces on the site. The portion of the first on inch (1”) which cannot be feasibly retained and/or infiltrated shall be treated using treatment methods consistent with the Final Total Maximum Daily Loads for affected receiving water and any additional treatment requirements in the Town of Braintree’s MS4 Permit. Pre-treatment of runoff from paved surfaces is required to remove 44% of the Total Suspended Solids prior to infiltration. Driveways associated with applications for single-family dwellings are exempt from this requirement as per the 2008 Mass DEP Stormwater Handbook, but to the extent practicable, runoff from such driveways shall be directed to adjacent pervious surfaces.

*The proposed drainage treatment train includes deep sump and hooded catch basins to at least one deep sump and hooded drain manholes prior to the subsurface infiltration chamber systems. **Please provide documentation that confirms that deep sump hooded drain manholes will provide adequate treatment.***

- l. Stormwater outlets shall be designed to prevent erosion.

The overflow discharge from the site is surcharge flow from the lowest catch basin at the Storrs Ave entrance with surface runoff into Storrs Ave.

- m. For other structural stormwater controls not included in the Mass DEP Stormwater Handbook, or for which pollutant removal rates have not been provided, the effectiveness and pollutant removal of the structural control must be documented through third party studies and receive approval from the Department before being included in the design of a stormwater management system.

Please provide documentation for DEP approval for the use of deep sump hooded drain manholes as pretreatment to subsurface infiltration chamber systems.

Section 3 – Segmentation

- a. Proposed residential, commercial or industrial subdivisions shall apply these stormwater management criteria to the land development as a whole. Hydrologic parameters shall reflect the ultimate land development and shall be used in all engineering calculations.

The project parameters reflect the full development of the property and meets this requirement.

Section 4 – Sensitive Areas

- a. Stormwater discharges to critical areas with sensitive resources (i.e. shellfish beds, swimming beaches, aquifer recharge areas, water supply reservoirs, Areas of Critical Environmental Concern) may be subject to additional criteria, or may need to utilize or restrict certain stormwater management practices at the discretion of the Department.

The project does not discharge to a critical area, therefore this requirement is not applicable.

MASSACHUSETTS DEP STORMWATER MANAGEMENT STANDARDS

Compliance with Stormwater Management Performance Standards

The following is an abbreviated list of the ten (10) Stormwater Management Performance Standards, followed by our determination of compliance with each standard for this project.

1. Untreated stormwater outfalls, and outfalls that cause erosion are prohibited.
 - a. *As presented in the drainage calculation, this standard is intended to be met with surcharge overflow from the subsurface infiltration chambers in higher storm events which will discharge through the lowest catch basin at the Storrs Ave entrance driveway and surface flow towards Storrs Ave. **We recommend additional information be provided to confirm the discharge onto Storrs Avenue will not cause additional flooding to the Storrs Avenue closed drainage system.***
2. Post-development peak discharge rate must be equal or less than pre-development peak discharge rates.
 - a. *As presented in the drainage calculation, this standard is intended to be met for the 2-year, 10-year, 25-year and 100-year - 24 hour storm events as required. The treatment and attenuation of post development stormwater runoff being provided by proposed deep sump catch basins and deep sump drain manholes then three subsurface infiltration chamber systems within the parking areas. **See additional comments below which should be addressed to confirm this standard is met.***
3. Loss of annual recharge to groundwater shall be eliminated or minimized. To prevent storm damage, alteration of stream channels, and down-gradient or offsite flooding post-development discharge volume shall not exceed predevelopment discharge volume for the 2-year, 10-year, and 100-year 24-hour storms. Water Quality BMP must treat ½" of runoff unless the site is in a critical area and then Water Quality BMP must treat 1" of runoff.
 - a. *This will be addressed by the use of a proposed subsurface infiltration systems under the parking areas. The calculations show no increase in volume as required and this Standard has been met. **We recommend additional soil testing be performed within the proposed field locations, specifically system B and C to confirm the soil conditions used in the stormwater calculations.***
 - b. *For the proposed subsurface recharge system, a minimum 4-foot separation from the bottom of the BMP to the (ESHGW) is required unless a mounding analysis where the mounding analysis can demonstrate that the chamber storage volume is fully dewatered within 72 hours and that the groundwater mound that forms under the recharge system will not break out above the land or water surface. **We recommend that the groundwater elevation be determined for system A to confirm proper groundwater separation is provided. We recommend soil testing be performed within the proposed field locations for systems B and C to confirm the soil conditions and depth to the estimated seasonal high groundwater elevation (ESHGW) used in the stormwater calculations as the existing soil testing was not located within the systems and indicate that the existing soil conditions vary within the proposed area.***

4. A minimum of 80% Total Suspended Solids (TSS) removal is required and 44% TSS is required treatment prior to an infiltration BMP.
 - a. *The TSS calculations provide greater than 44% prior to the infiltration chamber system with deep sump catch basins and deep sump manholes in series. **As previously commented, the use of deep sump manholes should be documented as an approved DEP pretreatment BMP. The TSS calculations should be updated to show the proper TSS removal rate for infiltration chambers as 80%.***
 - b. *Water quality treatment calculations have not been provided. **Please provide water quality treatment calculations for each system.***
5. Source control and pollution prevention required for land uses with higher potential pollutant loads.
 - a. *Not Applicable.*
6. Specific source control and pollution prevention measures required for discharge to or near Critical Areas.
 - a. *Not Applicable*
7. Although the project proposes to rehabilitate the existing site, it is indicated that the project will meet the standards as a new development for purposes of the Stormwater Management Standards.
 - a. *Not Applicable*
8. A Pollution, Erosion, and Sedimentation Plan for the construction period is required.
 - a. *A Construction Management Plan has been provided which proposes erosion and sedimentation barriers for the construction period in conjunction with an Erosion and Sedimentation Control Plan. **We recommend that inlet protection be noted on the plans at catch basin locations to be maintained. Will protection of the catch basins within Storrs Avenue be needed as this will be the low point should sediment discharge from the site? Approximate soil stockpile and construction staging locations should be shown on the plans. Will temporary sedimentation basins be required during construction? The development consists of the alteration/disturbance of more than 1 acre of land and requires a Construction General Permit (CGP) be obtained from EPA including a Stormwater Pollution Prevention Plan (SWPPP). We recommend a copy of the CGP and SWPPP be provided to the Town.***
9. A long-term operation and maintenance plan is required.
 - a. *Stormwater Operation and Site Maintenance plans for each residential development (Apartments and Condominium) are included with the submittal. **We recommend confirmation that the Conservation Commission is the appropriate contact for the Town for responsible party contact information or plan changes.***
10. All illicit discharges are prohibited.

*An Illicit Discharge statement has been provided within the Stormwater Report. **The Illicit Discharge Statement signed by the applicant or their representative should be provided.***

ADDITIONAL COMMENTS

We offer the following additional comments:

1. ***Please correct the minor inconsistency in the 10-year storm rainfall rate between the HydroCad models and the Stormwater Comparison Chart.***
2. ***In both the pre- and post-construction drainage models, the time of concentration for each subcatchment should be provided and the minimum time of concentration of 6 minutes should be used.***
3. ***Please review the off-site up gradient watershed area that will contribute surface runoff onto the site and how this may impact the site's drainage facilities.***
4. ***Please review the drainage models final design points, it seems that there should be two separate design points to better evaluate the discharges to the existing closed drainage system and the surface runoff towards the abutting Athletic Field and Storrs Avenue.***
5. ***Please provide supporting information for the use of HSG A soils within the drainage models. The existing soil testing indicates various soil conditions on site.***
6. ***A minor adjustment to the grass cover area per the watershed plan (6,131, vs 6,113) for subcatchment PC1 should be addressed.***
7. ***Please clarify the purpose of the Storage Group A with the infiltration chamber systems within the drainage model.***
8. ***Should there be only one primary device (catch basin structure) for Pond P1 (system A)? The overflow catch basins should be modeled as horizontal plane orifice openings with grate configuration rather than a broad crested weir.***
9. ***It is recommended that an overflow connection to the existing closed drainage system be considered in the design to minimize the surcharge overflow within the proposed drainage system.***
10. ***The 12" outlet pipe from Pond P2 (system B) is identified as invert 60.5 on the plans, the HydroCad should be updated to match the plan and the outlet invert should be updated as well.***
11. ***Although the Cultec chamber R-V8HD is an option within the HydroCad program, this Cultec chamber is not represented as an available model in the Cultec manufacturers documentation. Please confirm this chamber is still available or adjust the design to use an available chamber.***
12. ***It is recommended that a section through the infiltration chamber system B and the retaining wall be provided to show how the system and the retaining wall will be constructed. It is recommended that a barrier be provided to prevent groundwater breakout as the bottom of the system is designed between 2-4 feet above existing grade.***
13. ***Please correct the width of system B on the Cultec Chamber Typical Section.***
14. ***It is recommended that a mounding analysis be performed on each infiltration chamber system to confirm that they will not have any impacts on the surrounding foundation structures or retaining walls. Protection barriers should be provided as necessary.***
15. ***Please provide a detail of the manifold configuration for the infiltration chamber systems.***
16. ***Please provide roof leader and drainage pipe information on plans, including pipe size, material and length for all pipes. Will a 6" roof leader system be adequate to collect the entire roof discharge from the proposed 70-unit residential building?***
17. ***On the Utility Plan, the catch basin rim within the parking area to the left side of the 3-unit town house building should be corrected to match the Grading Plan.***

18. Please verify velocities within closed drainage systems as a few drain pipes have slopes greater than 6% to minimize potential for scour.

19. Please provide a detail for the oil/water separator.

Merrill appreciates the opportunity to review this project for the Department of Planning and Community Development. Please feel free to call me with any questions or to request additional information.

Very truly yours,

MERRILL ENGINEERS AND LAND SURVEYORS



Deborah W. Keller, P.E.
Senior Project Manager

H:\19-229\Documents\Reviews\19229 PBReview Report Parkside Development 09 23 19.docx